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International Specialists in the Environment

MEMORANDUM

TO: Pete Culver, RPO

THRU: John Caoile, FITOM

FROM: Wesley McCall

DATE: May 8, 1989

RECEIVED

MAY 09 1989

PREP SECTION

SUBJECT: HRS considerations for the site investigation of the Umthun Trucking/Linwood Quarry site, Buffalo, Iowa
 TDD# F-07-8809-008 PAN# FIA0236SA
 Site #V86 Project#001
 Superfund Contact: Pete Culver

The Ecology and Environment, Inc., Field Investigation Team (E & E/FIT) was tasked by Region VII U.S. Environmental Protection Agency (EPA) under Technical Directive Document (TDD) F-07-8809-008 to carry out a preliminary field reconnaissance and prepare a work plan for the Umthun Trucking/Linwood Quarry site in Buffalo, Iowa. Umthun Trucking leases property from Linwood Mining and Minerals Corp. which owns and operates the Linwood Quarry. The Linwood Quarry began operation as an open pit limestone quarry in the 1940's and subsequently began subsurface mining. Several hundred acres have been excavated since subsurface mining began.

There are three coal fired lime kilns which are operated at the Linwood Quarry. The fly ash produced by these kilns is the material of concern at this site. Analysis of the ash indicates that it contains as much as 2.9% sulfur. The fly ash may also contain elevated levels of heavy metals such as lead, cadmium, chromium, and vanadium. The sulfur present could produce acidic conditions enhancing the mobility of the heavy metal species in the surface and ground water.

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Superfund

Preliminary Hazardous Ranking System (HRS) scores have been calculated for the Umthun Trucking/Linwood Quarry site based on available information. The preliminary ground water pathway score is 28.44. Both the surface dumped fly ash and the ash vented to the underground mine works could potentially be contaminating the local aquifer with heavy metals. Ground water from the aquifer is used for residential, municipal, and industrial purposes within three miles of the site. Heavy metals (Pb, Cd, Cr, Cu, V, and Zn) were detected at elevated levels in the Umthun Trucking well which is used for drinking water. If an observed release could be confirmed, this would give a projected score of 38.78 for the ground water pathway.

A preliminary surface water pathway score of 9.70 was calculated for this site. The three principal factors contributing to this score are a) volume of waste >100,000 cubic yards, b) lack of containment of the fly ash, and c) proximity to wildlife refuge on the Mississippi River. If downstream municipal water intakes are found to exist, the projected score for the site would be 41.82.

Since there are no data available to document an air release at this time, the air pathway was not evaluated. There is high potential for air release if the surface dumped fly ash is found to contain heavy metals.

Calculations using the current ground water, surface water, and air pathway scores yields a preliminary HRS score of 17.37. If releases for the two pathways could be documented this would produce a projected overall score of 32.97.

A direct contact score of 37.5 was calculated for the Umthun Trucking/Linwood Quarry site based on the poor containment and easy accessibility of the wastes. No Fire and Explosion score was calculated due to the lack of flammable and explosive waste materials at this site.

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REGION VII FIT
HRS EVALUATION WORKSHEET

Site Name: Umthun Trucking City: Buffalo, Iowa
WST #07IA0236 Site #V86 CERCLIS #IAD980852297
Date of PA Completion 09/02/83, by IDWAWM
Major Contaminant(s) Pb, Cd, Cu, Cr, V, pH < 2 Date: May 8, 1989

<u>Scoring Scenarios</u>	<u>Preliminary Score</u>	<u>Projected Score</u>
Ground Water Route (Sgw) =	23.96	32.65
Surface Water Route (Sw) =	9.70	41.82
Air Route (Sa)	0	54.49
Total Score (Sm)	14.94	43.96

Potential Releases (Probability)

H	M	L	Nil	- Ground Water
H	M	L	Nil	- Surface Water
H	M	L	Nil	- Air
H	M	L	Nil	- On-Site/Direct Contact

HRS-2 Comments

Ground Water Route:

Potential for ground water release is high since wastes can migrate through the highly permeable limestone. The score could increase slightly with the additional mile radius, and also increase in score due to the limestone described as karst, which is evaluated separately under HS-2.

Surface Water Route:

Surface water runoff would be contaminated by the piles of coal fly ash and then would migrate to the Mississippi River. HRS-2 evaluation could increase the score with the 15 mile distance downstream, and locating drinking water intakes.

Air Route

Potential for air release is high due to the exposed piles of fly ash which could become airborne. Analysis of the fly ash will allow calculation of Air Route score.

On-Site Route:

The potential for direct contact is possible since wastes are exposed at the surface. Wastes are poorly contained and easily accessible.

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Probability to Score above 25.0

☐ High ☒ Medium ☐ Low

Priority For Further Work

☐ High ☒ Medium ☐ NFRAP

Comments

The fire and explosion route was not evaluated. The potential for a ground water release is high. Because piles of fly ash are exposed on the site surface, the probability for air and surface water contamination are both of medium potential. The current Direct Contact score is 37.5.

***** GROUND WATER ROUTE WORK SHEET *****

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	Preliminary Score	Projected Score	Ref.	Comments
1. <u>OBSERVED RELEASE</u>	<u>0</u>	<u>45</u>	<u>1</u>	
2. <u>ROUTE CHARACTERISTICS</u>				
DEPTH TO AQUIFER OF CONCERN (2)	<u>6</u>	<u>6</u>	<u>1,6</u>	<u>Wastes immediately above water table</u>
NET PRECIPITATION	<u>1</u>	<u>1</u>	<u>6</u>	<u>- 2 inches</u>
PERMEABILITY OF UNSATURATED ZONE	<u>2</u>	<u>2</u>	<u>1,3</u>	<u>Fractured limestone</u>
PHYSICAL STATE	<u>2</u>	<u>2</u>	<u>1,6</u>	<u>Fly ash - fine material</u>
CHARACT. SCORE =	<u>11</u>	<u>11</u>		
3. <u>CONTAINMENT</u>	<u>3</u>	<u>3</u>	<u>6</u>	<u>Uncovered piles, no liner</u>
4. <u>WASTE CHARACTERISTICS</u>				
TOXICITY/PERSISTENCE	<u>18</u>	<u>18</u>	<u>2</u>	<u>Lead</u>
HAZARDOUS WASTE QUANTITY	<u>8</u>	<u>8</u>	<u>6</u>	<u>As much as 100,000 cubic yds. of kiln fly ash</u>
WASTE CHARACT. SCORE =	<u>26</u>	<u>26</u>		
5. <u>TARGETS</u>				
GROUND WATER USE (3)	<u>9</u>	<u>9</u>	<u>3</u>	<u>No known unthreatened sources available</u>
DISTANCE TO NEAREST WELL/ POPULATION SERVED	<u>10</u>	<u>10</u>	<u>1</u>	<u>Well on site; pop. of Buffalo = 420</u>
TOTAL TARGETS SCORE =	<u>19</u>	<u>19</u>		
GROUND WATER ROUTE SCORE = (57,330/100 factor)	<u>28.44</u>	<u>38.78</u>		

() Multiplier

***** SURFACE WATER ROUTE WORK SHEET *****

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	Preliminary Score	Projected Score	Ref.	Comments
1. <u>OBSERVED RELEASE</u>	<u>0</u>	<u>45</u>	<u> </u>	<u>Possible but not probable</u>
2. <u>ROUTE CHARACTERISTICS</u>				
FACILITY SLOPE AND INTERVENING TERRAIN	<u>2</u>	<u>2</u>	<u>4</u>	<u>Slope = 140'/3000'</u>
1-yr., 24-hr. RAINFALL	<u>2</u>	<u>2</u>	<u>5</u>	<u>1 yr, 24/hr = 2.75</u>
DISTANCE TO NEAREST SURFACE WATER (2)	<u>4</u>	<u>4</u>	<u>4</u>	<u>3000' to Mississippi River</u>
PHYSICAL STATE	<u>2</u>	<u>2</u>	<u>1,6</u>	<u>Powder from baghouse</u>
ROUTE CHARACT. SCORE =	<u>10</u>	<u>10</u>		
3. <u>CONTAINMENT</u>	<u>3</u>	<u>3</u>	<u>1</u>	<u>Open piles in mine tunnels and on surface</u>
4. <u>WASTE CHARACTERISTICS</u>				
TOXICITY PERSISTENCE	<u>18</u>	<u>18</u>	<u>2</u>	<u>Lead, Cd, Cr, Cu</u>
HAZ. WASTE QUANTITY	<u>8</u>	<u>8</u>	<u>6</u>	<u>As much as 100,000 cubic yds.</u>
WASTE CHARACT. SCORE =	<u>26</u>	<u>26</u>		
5. <u>TARGETS</u>				
SURFACE WATER USE (3)	<u>6</u>	<u>9</u>	<u>3</u>	<u>No commercial fishing, possible drinking water</u>
DISTANCE TO A SENSITIVE ENVIRONMENT (2)	<u>2</u>	<u>2</u>	<u>4</u>	<u>Refuge 3000' away</u>
POPULATION SERVED/DISTANCE TO	<u>0</u>	<u>12</u>	<u>3</u>	<u>No intakes known; could assure for highest score</u>
DOWNSTREAM WATER INTAKE				
TOTAL TARGETS SCORE =	<u>8</u>	<u>23</u>		
SURFACE WATER ROUTE SCORE =	<u>9.70</u>	<u>41.82</u>		
(64,350/100 factor)				
() Multiplier				

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Direct Contact Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)	
1 Observed Incident	0 45	1	0	45	8.1	
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2						
2 Accessibility	0 1 2 3	1	3	3	8.2	
3 Containment	0 15	1	15	15	8.3	
4 Waste Characteristics Toxicity	0 1 2 3	5	15	15	8.4	
5 Targets					8.5	
Population Within a 1-Mile Radius	0 1 2 3 4 5	4	8	20		
Distance to a Critical Habitat	0 1 2 3	4	4	12		
Total Targets Score			12	32		
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			8100	21,600		
7 Divide line 6 by 21,600 and multiply by 100			SDC = 37.5			

FIGURE 12
DIRECT CONTACT WORK SHEET

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PRELIMINARY SCORE	s	s ²
Groundwater Route Score (S _{gw})	28.44	808.83
Surface Water Route Score (S _{sw})	9.70	94.09
Air Route Score (S _a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		902.92
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		30.05
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		17.37

WORKSHEET FOR COMPUTING S_M

PROJECTED SCORE	s	s ²
Groundwater Route Score (S _{gw})	38.78	1504
Surface Water Route Score (S _{sw})	41.82	1749
Air Route Score (S _a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		3253
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		57.04
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		32.97

WORKSHEET FOR COMPUTING S_M

[illegible]